

Application No. 10/775,488
Amendment dated September 23, 2008
Reply to Non-Final Office Action of April 15, 2008

Amendments To the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended). A switch coupled between a plurality of host units and a device for communicating there between and comprising:

- a) a first serial advanced technology attachment ~~[[(ATA)]]~~ (SATA) port including a first host task file, coupled to a first host unit, the first host task file responsive to commands sent by the first host unit, to the device;
- b) a second ~~[[serial ATA]]~~ SATA port including a second host task file, coupled to a second host unit ~~[[including a second host task file]]~~, the second host task file responsive to commands sent by the second host unit, to the device;
- c) a third ~~[[serial ATA]]~~ SATA port including a device task file, coupled to a device, for causing access, by the first or second host units, to the device, the device operative to support command queuing and operative to generate an original queue depth value indicative of the number of commands that the device can queue from either of the first or second host units; and
- d) an arbitration and control circuit~~[[,]]~~ coupled to the first, second and third ports, for selecting one of the first host or second host units to concurrently access the device, through the switch, by accepting commands, from either of the first or second host units, at any given time, including when the device is not in an idle state, the arbitration and control circuit being responsive to the original queue depth value and operative to alter the original queue depth value to be a queue depth value that is less than the original queue depth value so that each of the first and second host units is assigned less than the number of commands indicated by the original queue depth value but that the total number of commands that can be queued by the first and second host units remains the same as the original queue depth value thereby misrepresenting the original queue depth value to the first and second host units to be less than that which it is thereby preventing commands being lost by an overrun of the original queue depth value by either of the first or second host units.

Claim 2 (canceled).

Claim 3 (canceled).

1 Claim 4 (currently amended): A switch as recited in claim 1 wherein said third [[serial ATA]]
2 SATA port includes a device task file.

1 Claim 5 (currently amended): A switch as recited in claim 1 wherein said first, second and third
2 SATA ports are level 4 ports.

1 Claim 6 (original): A switch as recited in claim 1 wherein said device is a storage unit.

1 Claim 7 (original): A switch as recited in claim 1 wherein said switch is employed in an
2 enterprise system.

1 Claim 8 (canceled).

1 Claim 9 (original): A switch as recited in claim 1 wherein information, in the form of data,
2 commands or setup, is transferred from the device to the first or second host units through
3 the switch and the information is modified by the switch prior to being received by the
4 first or second host units such that modified information rather than the information is
5 received by the first or second host units.

1 Claim 10 (original): A switch as recited in claim 9 wherein the information is referred to as
2 'identify drive response'.

1 Claim 11 (original): A switch as recited in claim 9 wherein the information is referred to as
2 'Tag'.

1 Claim 12 (original): A switch as recited in claim 1 wherein information, in the form of data,
2 commands or setup, is transferred from the first or second host units to the device through
3 the switch and the information is modified by the switch prior to being received by the
4 device such that modified information rather than the information is received by the
5 device.

- 1 Claim 13 (original): A switch as recited in claim 12 wherein the information is referred to as
2 'Tag'.
- 1 Claim 14 (original): A switch as recited in claim 12 wherein the arbitration and control circuit
2 include a Tag/Active Mapping Circuit for mapping a host tag to a device tag and inverse
3 mapping for identifying a host.
- 1 Claim 15 (original): A switch as recited in claim 1 wherein either the first or the second host
2 sends a legacy queue command queued by the device.
- 1 Claim 16 (previously presented): A switch as recited in claim 1 wherein either the first or the
2 second host sends a native queue command for execution thereof by the device.
- 1 Claim 17 (previously presented): A switch as recited in claim 16 wherein the Tag in the
2 native queue command is modified prior to sending to the Device to avoid using the same
3 Tag for both hosts and not to exceed the maximum allowed Tag value.
- 1 Claim 18 (previously presented): A switch as recited in claim 17 wherein the Tag received in
2 a FIS from the Device is modified to its original value prior to sending the same to the
3 Host.
- 1 Claim 19 (currently amended): A switch as recited in claim 1 wherein the first, second and
2 third ports are level 3 [[serial ATA]] SATA ports and a Data FIS FIFO and an associated
3 FIFO Control are coupled to the first, second and third SATA ports and are located
4 externally thereto.
- 1 Claim 20 (currently amended): A switch comprising:
2 a) a first serial advanced technology attachment [[[ATA]]] SATA port including a
3 first host task file for connection to a first host unit, the first host task file
4 responsive to commands sent by the first host unit;

- b) a second ~~[[serial ATA]]~~ SATA port including a second host task file for connection to a second host unit, the second host task file responsive to commands sent by the second host unit;
- c) a third ~~[[serial ATA]]~~ SATA port including a device task file, for connection to a device, the device operative to support command queuing and operative to generate an original queue depth value indicative of the number of commands that the device can queue from either of the first or second host units; and
- d) an arbitration and control circuit, coupled to the first, second and third SATA ports, for selecting either the first host unit or the second host unit to concurrently access the device, through the switch, by accepting commands, from either of the first or second host units, at any given time, including when the device is not in an idle state, the arbitration and control circuit being responsive to the original queue depth value and operative to alter the original queue depth value to be a queue depth value that is less than the original queue depth value so that each of the first and second host units is assigned less than the number of commands indicated by the original queue depth value but that the total number of commands that can be queued by the first and second host units remains the same as the original queue depth value thereby misrepresenting the original queue depth value to the first and second host units to be less than that which it is thereby preventing commands being lost by an overrun of the original queue depth value by either of the first or second host units.

Claim 21 (currently amended): A switch as recited in claim 20 wherein the switch is a ~~[[serial ATA]]~~ SATA switch.

Claim 22 (canceled).

Claim 23 (canceled).

Claim 24 (canceled).

Claim 25 (original): A switch as recited in claim 20 wherein said device is a storage unit.

1 Claim 26 (original): A switch as recited in claim 20 wherein said switch is employed in an
2 enterprise system.

1 Claim 27 (canceled).

1 Claim 28 (original): A switch as recited in claim 20 wherein information, in the form of data,
2 commands or setup, is transferred from the device to the first or second host units through
3 the switch and the information is modified by the switch prior to being received by the
4 first or second host units such that modified information rather than the information is
5 received by the first or second host units.

1 Claim 29 (original): A switch as recited in claim 28 wherein the information is referred to as
2 'TAG'.

1 Claim 30 (original): A switch as recited in claim 28 wherein the information is referred to as
2 'identity drive response'.

1 Claim 31 (original): A switch as recited in claim 20 wherein information, in the form of data,
2 commands or setup, is transferred from the first or second host units to the device through
3 the switch and the information is modified by the switch prior to being received by the
4 device such that modified information rather than the information is received by the
5 device.

1 Claim 32 (original): A switch as recited in claim 31 wherein the information is referred to as
2 'Tag'.

Claim 33 (currently amended): A method of employing a switch coupled between a plurality of host units and a device for communicating therebetween, the method comprising:

- a) coupling a first serial advanced technology attachment [[[ATA]]] SATA port to a first host unit;
- b) coupling a second [[serial ATA]] SATA port to a second host unit;
- c) coupling a third [[serial ATA]] SATA port to a device;
- d) receiving commands through a first host task file;
- e) receiving commands through a second host task file; [[and]]
- f) receiving commands through a device task file;
- [f)] g) selecting one of the first host or second host units to concurrently access the device, through the switch, by accepting commands, through the first host and second host task files, from either of the first or second host units, at any given time, including when the device is not in an idle state;
- h) intercepting an original queue depth value from the device, the queue depth value being indicative of the number of commands that the device can queue from either of the first or second host units; and
- i) altering the original queue depth value to be a queue depth value that is less than the original queue depth value so that each of the first and second host units is assigned less than the number of commands indicated by the original queue depth value but that the total number of commands that can be queued by the first and second host units is the same as the original queue depth value thereby avoiding commands being lost by overrun of the original queue depth value.

Claim 34 (previously presented): A method of employing a switch, as recited in claim 33, further including the steps of transferring information, in the form of data, commands or setup, from the device to the first or second host units through the switch and modifying the information prior to the information being received by the first or second host units such that modified information rather than the information is received by the first or second host units.

- 1 Claim 35 (previously presented): A method of employing a switch, as recited in claim 34,
2 wherein the information is referred to as 'identify drive response'.
- 1 Claim 36 (previously presented): A method of employing a switch, as recited in claim 34,
2 wherein the information is referred to as 'Tag'.
- 1 Claim 37 (previously presented): A method of employing a switch, as recited in claim 34,
2 further including the steps of transferring information, in the form of data, commands
3 or setup, from the first or second host units to the device through the switch and
4 modifying the information by the switch prior to being received by the device such
5 that modified information rather than the information is received by the device.
- 1 Claim 38 (previously presented): A method of employing a switch, as recited in claim 37,
2 wherein the information is referred to as 'Tag'.
- 1 Claim 39 (previously presented): A method of employing a switch, as recited in claim 37,
2 wherein mapping a host tag to a device tag and inverse mapping for identifying a host.
- 1 Claim 40 (previously presented): A method of employing a switch, as recited in claim 34,
2 further including the step of sending a legacy queue command queued.
- 1 Claim 41 (previously presented): A method of employing a switch, as recited in claim 34,
2 further including the step of sending a native queue command for execution thereof by
3 the device.
- 1 Claim 42 (previously presented): A method of employing a switch, as recited in claim 41,
2 wherein modifying the Tag in the native queue command prior to sending to the
3 Device to avoid using the same Tag for both hosts.

- 1 Claim 43 (previously presented): A method of employing a switch, as recited in claim 42,
2 wherein modifying the Tag received in a FIS from the Device prior to sending the
3 same to the Host.

- 1 Claim 44 (new): A switch, as recited in claim 1, wherein the queue depth value
- 2 reported to each of the first and second host units is no more than half of the original
- 3 queue depth value.

Claim 45 (new): A switch, as recited in claim 1, wherein in response to an identify drive command from either of the first or second host units, the arbitration and control circuit is configured to intercept an identify drive response, which is generated by the device in response to the identify drive command, and to replace the original queue depth value with a queue depth value that is no more than one-half that reported by the device.